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well represented by a logarithmic curve. This is the first law of growth in *Ceratophyllum* and may be stated as follows: "On any axial division of the plant the mean number of leaves per whorl increases with each successive whorl in such a way that both the absolute increment and the rate of increase diminish as the distance (in units of nodes) of the whorl from a fixed point increases."

The second law of growth is that of diminishing variability. The whorls of leaves produced by a growing point are formed with ever increasing fidelity to type. "The growing point appears to be influenced in its morphogenetic activity by its previous experience."

To the students of evolution, who are now concerning themselves primarily with experimental and statistical investigations of variation and heredity, the importance of such a detailed study of intra-individual variation, correlation and differentiation will be apparent. In the original paper they will find a wealth of analyzed material.

J. A. HARRIS

Cotton.—*Its Cultivation, Marketing, Manufacture, and the Problems of the Cotton World.* By Charles William Burkett, Professor of Agriculture, North Carolina College of Agriculture and Mechanic Arts, and Clarence Hamilton Poe.¹—This volume of over three hundred pages is interesting from many points of view. Its illustrations are reproductions in a sepia tone of much effectiveness and the contrasts, especially in the case of white cotton bolls are very pleasing. Moreover many of the sketches are likely to be of permanent interest as matters of record, notably those which give some notion of fast-vanishing methods of carding, spinning, and weaving cotton by hand. The authors have spared no pains to make the illustrations attractive and useful, and they have succeeded admirably. The text is clearly written, throughout, and it is well-arranged with respect to convenience of reference. Moreover, the facts as regards the botany, the agriculture, and the commercial relations of the cotton-plant, are carefully stated in such a manner as to be quite within the reach of the general reader, but we miss what ought never to be lacking in any book of reference,—an index. The value of this useful treatise would be enhanced tenfold by a copious alphabetical and subject index.

G. L. GOODALE

Notes.—Three new species of *Dendromecon* are described by Fedde in *Repertorium Novarum Specierum* of Jan. 15.

¹ New York, Doubleday, Page & Company.

Notes and illustrations concerning *Robinia Neo-Mexicana* are published by Phillips in *Forestry and Irrigation* for February.

An illustrated economic account of *Nyssa aquatica*, by von Schrenk, has been reprinted from the "Silver anniversary edition" of *The Southern Lumberman*.

Vaccinium Dobbini is the name proposed by Burnham in *The American Botanist* of February for a New York relative of *V. vacillans*.

A revision of *Spilanthes*, by A. H. Moore, constituting no. 33 of the new series of "Contributions from the Gray Herbarium of Harvard University," is published as vol. 42, no. 20 of the *Proceedings of the American Academy of Arts and Sciences*.

A paper on *Citharexylum*, by Greenman, forms *Publication 117* of the Field Columbian Museum.

On Pringle's Santa Catalina Mountain material of 1881, Dode bases a new *Juglans elaeopyren* in the *Bulletin de l'Herbier Boissier* of February 28.

An economic account of the walnut in Oregon is published by Lewis in *Bulletin no. 92* of the Agricultural Experiment Station of that State.

A new Californian oak, *Quercus Pricei*, is described by Sudworth in *Forestry and Irrigation* for March.

Several new aloids and other succulents are described by Berger in vol. 4, no. 38 of the *Notizblatt des K. Botanischen Gartens und Museums zu Berlin*.

Agave deserti is figured in detail in *Icones Selectæ Horti Thenensis*, vol. 6, fasc. 1.

A series of notes on Abietineæ, by Hickel, are appearing in the *Bulletin de la Société Dendrologique de France*.

Cardot and Thériot report on a collection of 63 Alaskan mosses in vol. 2, no. 13 of the *University of California Publications, Botany*.

Vol. 7, part 2, of *North American Flora* is occupied with a part of the Uredinales, by Arthur.

An extensive and well illustrated paper by Lyman on "Culture Studies on Polymorphism of Hymenomycetes," constituting no. 64 of the "Contributions from the Cryptogamic Laboratory of Harvard University," forms vol. 33, no. 4 of the *Proceedings of the Boston Society of Natural History*.

An enumeration of the fungi collected by Simmons on the second Norwegian Polar expedition, by Rostrup, was published in no. 9 of the *Report* on the Expedition shortly before the death of the author, which occurred in January.

Several quite distinct puff balls and phalloids of Argentina are described and figured by Spegazzini in a paper recently distributed from vol. 16 of the *Anales del Museo Nacional de Buenos Aires*.

A flora of Central Europe, with text cuts and colored plates, by Hegi and Dunzinger, is being issued in 70 monthly parts from the Lehmann Press of Munich.

With vol. 3, fasc. 7, issued in December, Coste's "Flore Descriptive et Illustrée de la France" etc. was brought to a conclusion, the final signatures dealing with Pteridophytes.

An ecological systematic account of the flora of Columbia, Missouri, by F. P. Daniels, forms vol. 1, no. 2 of the Scientific Series of *The University of Missouri Studies*. Twelve new species or varieties and 26 new names occur in the list, which includes 13 genera, with 19 species, of Pteridophytes and 422 genera, with 1039 species, of Spermatophytes.

A general biological study of the sand areas of Illinois, by Hart and Gleason, forms vol. 7, article 7 of the *Bulletin of the Illinois State Laboratory of Natural History*.

The distribution and adaptation of the vegetation of Texas are discussed by Bray in *Bulletin no. 82* (Scientific Series no. 10) of the University of Texas.

A study of the flora of the Sand Keys of Florida, by Millspaugh, forms *Publication 118* of the Field Columbian Museum.

A further paper on the grasses of Argentina has been published by Stuckert in vol. 13 of the *Anales del Museo Nacional de Buenos Aires*.

The first fascicle of vol. 3 of Arechavaleta's "Flora Uruguaya" has recently been issued as a part of vol. 6 of the *Anales del Museo Nacional de Montevideo*.

Mr. Cook's concept of "Kinetic Evolution" is set forth in extenso in a large brochure of vol. 8 of the *Proceedings of the Washington Academy of Sciences*, issued on February 13th.

Separates of Dr. Robinson's paper on "The Problems of Ecology" have been distributed from vol. 5 of "*Congress of Arts and Sciences, Universal Exposition, St. Louis, 1904.*"

Studies on the pollination of Wisconsin flowers are being published by Graenicher in current numbers of the *Bulletin of the Wisconsin Natural History Society*.

Von Ihering contributes an illustrated account of the myrmecophilous *Cecropias* to recent numbers of Engler's *Botanische Jahrbücher*.

Dissemination by the aid of ants is the subject of a well illustrated memoir by Sernander, forming vol. 41, no. 7 of the *K. Svenska Vetenskapsakademiens Handlingar*.

A large preliminary paper on the fungi of certain termite nests, by Petch, is published, with illustrations, in vol. 3, part 2 of the *Annals of the Royal Botanic Gardens, Peradeniya*.

A comprehensive bibliographic, botanical and physiological memoir on tannoids, by Dekker, forms no. 35 of the *Bulletin van het Koloniaal Museum te Haarlem*, printed in December last.

A long list of plants known to contain prussic acid is separately distributed by Greshoff from the 1906 *Report of the British Association for the Advancement of Science*.

Studies on the influence of spectral colors on the sporulation of *Saccharomyces* are reported by Purvis and Warwick in vol. 14, part 1 of the *Proceedings of the Cambridge Philosophical Society*.

The root-knees of *Sonneratia* are well figured in the *Annual Report of the Director of Forestry of the Philippine Islands for the Period July, 1905 to June 30, 1906*.

A rope-like tumor of *Betula populifolia* is described and figured by Penhallow in a separate from vol. 12 of the *Transactions of the Royal Society of Canada*.

An illustrated account of commercial seeds of brome grass and blue grass and their adulterants, by Roberts and Freeman, forms *Bulletin 141* of the Kansas Agricultural Experiment Station.

Tobacco breeding is considered by Shamel and Cobey in *Bulletin no. 96* of the Bureau of Plant Industry, U. S. Department of Agriculture.

An illustrated editorial account of the Mexican "guayule" is being published in current numbers of *The India Rubber World*.

A discussion of timber under conditions of modern demand and growth, by von Schrenk and others before the New England Railroad Club, has been distributed in pamphlet form by the Rand Avery Supply Company of Boston.

A series of "Forest Planting Leaflets," each dealing with a single species, is being published as *Circulars of the Forest Service* of the United States Department of Agriculture.

Studies of the wood of Javan trees, by Moll and Janssonius, are being published by the Brill Press of Leiden.

A second edition of the useful "Key to the Genera of Woody Plants in Winter," by Wiegand and Foxworthy, has been issued by the authors, whose address is Ithaca, N. Y.

A portrait, with short biographic sketch, of the late Sir Thomas Hanbury is given in *The Gardeners' Chronicle* of March 16th.

A portrait of H. N. Ridley is given in *Tropical Life* for January.

An appreciative notice of Marshall Ward, by the late Director of Kew Gardens, appears in *The New Phytologist* of January 31.

Fascicle 4 of de Wildeman's "Énumération des Plantes Récoltées par Emile Laurent," issued in February, contains a portrait and biographic sketch of Laurent.

Further articles on Burbank and his work, by DeVries, appear in the *Biologisches Centralblatt* for September, *The Open Court* for November, and *The Century Magazine* for March.

W. T.

GEOLOGY.

The Elements of Geology.¹—Professor Norton of Cornell College, Iowa, has sought to present to the public an elementary textbook on geology "in which causes and their consequences should be knit together as closely as possible." He accordingly departs from the usual three-fold division into dynamical, structural, and historical geology, treating geological processes and the forms or structures which they produce in immediate connection, under the headings "External Geological Agencies" and "Internal Geological Agencies." A third part of the book treats of Historical Geology.

Under the heading "External Geological Agencies" the work of

¹ Norton, William Harmon, *The Elements of Geology*. Boston, Ginn & Company. x+462 pp., 374 illustrations.